

SOME NEW TAXA OF HEPATICAE

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Introduction

In the course of completion of my treatment of the Hepaticae for Engler & Prantl, Die Natürlichen Pflanzenfamilien, and of the North American Hepaticae in Vol. V. of The Hepaticae and Anthocerotae of North America, a number of novelties have been discovered. Rather than clutter up these treatments with Latin diagnoses, I prefer to place them in one convenient place. A number of them are gathered here, together with enough peripheral information to adequately establish these taxa. Detailed illustrated accounts of these taxa will appear in the works cited.

I. Austroscyphus Schust., nom. n. for Acroscyphus Kitagawa

In January 1984 I collected a highly nitid, caespitose alpine plant in the Paparoa Range, N.Z., whose generic provenance was puzzling. Indeed, it was the only member of the Jungermanniales I have collected in New Zealand in the last 22 years whose familial and generic provenance could not be established in the field. Study of the living plant, a few days later, in Dunedin, revealed that these plants had nitid, homogeneous oil-bodies -- a feature not previously seen in any member of the Balantiopsidaceae. Yet, in spite of the broad, succubous, entire-margined and unlobed leaves, the gametophyte with a Jungermannia or Jamesoniella-like facies, it was probable that a member of the Balantiopsidineae was at hand. The form of the underleaves and the rhizoid fascicles at underleaf bases, as well as the exclusively ventral-intercalary branching suggested this. Further study convinced me that this plant, which I had called Austroscyphus nitidissimus, was congeneric with Neesioscyphus phoenicorhizus Grolle and Clasmatocolea tjiwideiensis (Sde.-Lac.) Grolle. A paper was prepared and ready to send off to this journal in the summer of 1984 when Dr. John J. Engel sent me a xerox copy of a paper by Kitagawa (1984), which had just appeared. In this, a New Caledonian taxon is described as Acroscyphus iwatsukii Kitagawa. This plant is clearly related to A. phoenicorhizus and much less so to my "Austroscyphus" nitidissimus, and it was evident that, at the last moment, Austroscyphus was to be suppressed. I am grateful to Dr. Engel for having prevented me from inadvertently producing an unnecessary new genus -- and I would be still more grateful if he had not done so, for the reason that Acroscyphus Kitagawa is a later homonym of the lichen genus Acroscyphus Lévillé (1846). In the revised version of my MS, published in this journal early in 1985, Acroscyphus Kitagawa was substituted for Austroscyphus (Ms) and the

latter was used at the sectional level for the Acroscyphus nitidissimus-tjiwideiensis element.

With Acroscyphus illegitimate as a later homonym, the least nomenclatural confusion is caused by keeping this at the sectional level, as in Schuster (1985, p. 455), and in "elevating" Austroscyphus to generic rank. Intragenerically, thus, the classification proposed at the sectional level in Schuster (l.c., pp. 454-55) is preserved. The following new synonymy is, however, regrettably necessary:

Austroscyphus Schust., nom. n., for:

Acroscyphus Kitagawa, Acta Phytotax. Geobot. 35:1, 1984 [nec Léveillé, Ann. Sci. Nat. Bot., Ser. 3, 5:262, 1846; Lichenes; cf. Farr, Leussink & Stafleu, Index Nom. Gener. Plant., p. 20, 1979].

1. Austroscyphus sect. Austroscyphus Schust.

Basionym: Acroscyphus sect. Austroscyphus Schust., Phytologia 56:455, 1985. [Type: Austroscyphus nitidissimus (Schust.) Schust., comb. n. Basionym: Acroscyphus nitidissimus Schust., Phytologia 56:455, 1985].

Also fitting (doubtfully) here is Austroscyphus tjiwideiensis (Sde.-Lac.) Schust., comb. n. [Basionym: Chiloscyphus tjiwideiensis Sde.-Lac., Nedrl. Kruidk. Arch. 3:418, 1854 = Acroscyphus tjiwideiensis (Sde.-Lac.) Schust. & Engel, Phytologia 56:455, 1985].

Austroscyphus tjiwideiensis possibly, or probably, should go into its own section, since it is isolated from the other three species by the rough cuticle. It also is the only non-Gondwanalandic member of the genus (cf. key in Schuster, 1985).

I am grateful to Dr. Margaret Barr Bigelow for her help with the bibliographic details that resulted in the nomenclatural changes here proposed.

2. Austroscyphus sect. Acroscyphus (Kitagawa) Schust., sect. n.

Basionym: Acroscyphus Kitagawa, Acta Phytotax. Geobot. 35:1, 1984 (as genus); the Latin diagnosis of Acroscyphus at the generic rank can serve as a descriptio generico-specifica at the sectional level. The section is defined, in English, in the key on p. 455, in Schuster (l.c.)

Type: Austroscyphus iwatsukii (Kitagawa) Schust., comb. n. [Basionym: Acroscyphus iwatsukii Kitagawa, Acta Phytotax. Geobot. 35:1, 1984].

Also fitting here is Austroscyphus phoenicorhizus (Grolle) Schust. [Basionym: Neesioscyphus phoenicorhizus Grolle, Oesterr. Bot. Zeitschr. 111:27, 1964 = Acroscyphus phoenicorhizus (Grolle) Schust. & Engel, Phytologia 56:455, 456, 1985].

II. New Marchantiales

1. Marchantia subg. Protomarchantia Schust., subg. n. Subgenus a aliis duobus subgeneribus differens (a) archigoniaphoris valde bilateraliter symmetricalibus, a 2 dichotomis derivatis; (b) aggregationes archegoniorum infra brachii, his illisque non alternatis. Type: M. geminata R. Bl. & N.

The single species familiar to me which fits here occupies an anomalous position within Marchantia: the involucre is situated under the arms of the carpocephalum, rather than alternate with them. Schiffner [1893, pl. 14(19):2] provides the pertinent figures. The sole species fitting here is, in some respects, closer to Neohodgsonia Perss. than to Marchantia s. str. and probably further study will necessitate elevating Protomarchantia to autonomous generic status.

2. Preissia quadrata subsp. hyperborea Schust., subsp. n. Subspecies a subsp. quadrata differens ut semper autoecia; ♂ receptaculum ala lata translucida praeditum ad margines sursum versa; sporae plerumque tantummodo 50-70 μ m diam. max. Type: Godhavn, W. Greenland (RMS & K. Damsholt 66-280).

Since P. commutata appears to be a straightforward synonym of the relatively southern P. quadrata, the boreal-arctic phase here described appears to be without a name. P. quadrata is a complex species, requiring much further study.

3. Mannia paradoxa Schust., sp. n. Plantae parvae (thallus 2-2.5 ad 2.2-3.8 μ m lat.) cyanovirides, marginibus atropurpuriis; tela ventralis altitudine circa 0.6 altitudinis thalli; paroecia; androecia male definita, tantummodo 1-3 ad 2-4 antheridia sparsa posterior carpocephalo aggregata; carpocephalum umbonatum in basi barba subpurpurea aut squamis praeditum. Type: Carlsbad Caverns Natl. Park, New Mexico (RMS 82-201).

Although similar to Reboulia hemisphaerica subsp. hemisphaerica in the paroecious sexual condition, this is a much smaller plant and has nonlobed carpocephala. Distinct from all Mannia species I know in the paroecious, rather than autoecious, sexuality. Since well-developed carpocephala remain unknown (those seen were old and shrunken), the generic provenance remains somewhat uncertain.

4. Asterella bolanderi subsp. acrogyna Schust., subsp. n. Subspecies a subsp. bolanderi distincta ut (a) ♂ rami variabiles, nonnulli relative elongati, typice innovantes; (b) gynoecia terminalis in ramis primariis ad elongatis, saepe innovantia; (c) thalli steriles apicaliter repetite innovante, Opuntia-forma; (d) squamae ventrales 2-3 appendicibus praeditae. Type: Chisos Mts., above Boot Spring, Big Bend Natl. Park, Texas (RMS 81-245).

Perhaps an autonomous species, but since it is known from a solitary collection, best retained within a broadened concept of

A. bolanderi.

5. Sauteriaceae: Sauteria Nees. Sauchia Kashyap was reduced to a synonym of Sauteria by Shimizu & Hattori (1954, in 1953-55), a disposition with which I am fully in accord. However, Sauteria seems divisible into three species complexes, perhaps best regarded as sections, as follows:

a. Sectio Sauteria. Relatively generalized taxa with thallus not reduced, the air chambers in 2-3 tiers; pores conspicuously stellate; carpocephala retaining a considerable amount of sterile tissue (both pores and air chambers preserved), with involucre rather many (usually 4-7); androecia usually not on reduced ventral branches. Type: S. alpina (Nees) Nees.

b. Sectio Yatsuensis Schust., sect. n. Plantae in loculis pro aera in 2-3 stratis semper non differentiatas, poris satis aut vix stellatis, et in androecia non in ramis propriis nata; plantae differentiatas in (a) carpocephalis, tela receptaculari vestigiali, sine loculis pro aera et poris; (b) carpocephalis pauciores tantummodo 2-3 ad 4-5 lobos habentibus. Type: S. yatsuensis Shimizu & Hattori.

c. Sectio Sauchia (Kashyap) Schust., comb. n. [Basionym: Sauchia Kashyap, J. Bombay Nat. Hist. Soc. 24:347, 1916]. Advanced in thallus criteria [air chambers in 2 strata (S. japonica) or only 1 (S. spongiosa); pores bordered by 2-4 rings of delicate cells], in the carpocephala (lobes 1 or 2-4; receptacular tissue lost, without air chambers and pores), and in the androecia (with few ostioles, terminating stipitate, small, ventral branches). Type: S. spongiosa Kashyap.

6. Athalamia Falconer. A single species, A. hyalina, basically of arctic-alpine range, has been known from North America. A second species is known only from the Big Bend area, adjacent to the Mexican border:

Athalamia pygmaea Schust., sp. n. Species a A. hyalina differens (a) magnitudine minuta, thallus 1.5-2.2 mm lat.; (b) poris non stellatis, membranis radialibus non incrassatis; (c) squamis cryptarum gynoecialium subpurpureis potius quam albis; (d) sectionibus thalli semilunatis, tantummodo c. 2-2.5X latioribus quam altis, tela ventrali tam alta quam aerenchyma. Type: Near Boot Spring, Chisos Mts., Big Bend Natl. Park, Texas (RMS 81-1251a).

Unfortunately known only from a limited suite of female plants with unfertilized gynoecia; the male plant remains unknown. Rediscovery of adequate material will probably necessitate revisiting the locality after a rainy period. The plant was found, mixed with, i.e., Riccia lamellosa, Targionia, Plagiochasma rupestre, and Nostoc, on thin soil over exposed rocks, where subject to long periods of desiccation. The ecology is completely different from that of A. hyalina.

III. Subgeneric Perimeters in the Genus Riccia

Recent attempts to modify the long-accepted division of Riccia into two subgenera, Riccia s. str. and Ricciella, have appeared almost simultaneously. Indeed, these attempts have been almost synchronous (Volk, Dec. 31, 1983; Schuster, 1984; Jovet-Ast, 1984). Volk basically retained two subgenera, subg. Riccia (with 3 sections, Viridisquamata Na-Thalang, Riccia, Pilifer Volk) and subg. Spongodes (Nees) Volk = Ricciella auct., non A. Braun [also with 3 sections: Thallocarpus (Aust.) Volk, Spongodes Nees, Ricciella (A. Braun) Bischoff]. Of these sections, Jovet-Ast (1975) had regarded Thallocarpus as an autonomous subgenus and recently (Jovet-Ast, 1984) elevated sect. Viridisquamata to subgeneric rank. Sect. Pilifer was regarded by Schuster (1984, p. 72) as an autonomous genus, Pteroriccia, and Riccia subg. Leptoriccia was proposed (Schuster, l. c.) for R. membranacea --- a taxon neither of the other workers dealt with.

Volk (l.c., p. 454) makes the valid point that, with approximately 200 described species, any attempt to subdivide Riccia is welcome: it will, at least, allow us to better organize this mass of species into comprehensible units. However, he basically retains the old classification into two subgenera. I think that a subdivision into a series of subgenera, several of which consist of a series of sections, is greatly preferable. This also seems to be the position of Jovet-Ast (1975, 1984), who recognizes Viridisquamata and Thallocarpus as subgenera. I have restudied the Pteroriccia "complex" (Type: Riccia villosa Steph.) and find that the ventral scale criterion, which strikingly isolates the type species, does not hold for several other taxa which Volk properly places into the same taxonomic unit and which he independently recognizes as sect. Pilifer. Reconsideration of the entire problem of subdivision of the genus has convinced me that Pteroriccia (Pilifer Volk) is better recognized as a subgenus, Riccia subg. Pteroriccia (Schust.) Schust. [Basionym: Pteroriccia Schust., *Phytologia* 56:72, 1984]. Since Pteroriccia was validly published (Pilifer remains illegitimate since no type species was designated), it is used here. The six subgenera which appear to encompass the genus are separable as follows:

KEY TO THE SUBGENERA OF RICCIA

1. Mesomorphic taxa: dorsal epidermis distinct, complete (often lacunose soon after maturation), chlorophyllose, bearing distinct pores; air chambers typically large, irregular to polyhydral....2.
2. Spores not coherent in tetrads. Plants (if unisexual) not strikingly heterothallic.....3.
3. Spores areolate (areolae sometimes reduced to \pm irregular or furcate lamellae). Thalli with ventral tissue usually

distinct, often well developed.

Subg. Spongodes (Nees) Volk
[= Ricciella auct., non A. Braun]

3. Spores with numerous papillae, not arising from a reticulum. Thalli very thin, like fern prothalli, with ventral tissue vestigial.

Subg. Leptoriccia Schust.

2. Spores coherent in permanent tetrads. Unisexual plants, strikingly heterothallic (male plants usually dwarfed). Spores with distinct tubercles or papillae, either not arising from meshes or arising from a delicate network of meshes.

Subg. Thallocarpus (Aust.) Jovet-Ast

1. Xeromorphic taxa: dorsal epidermis bearing pores, per se, not distinct, but a dorsal epithelial layer that lacks chlorophyll in 1-several strata; large polyhedral air chambers lacking. Spores not remaining in tetrads.....4.
4. Chloroplasts predominantly in the dorsal tissues; ventral strata quite or nearly devoid of chloroplasts. Ventral surface with 2 rows of unistratose, nonchlorophyllose scales.....5.
5. Epithelial tissues above the ventral tissue in the form of mutually connate cell rows between which vertical air canals are distinct. Ventral scales rarely projecting beyond thallus margins, normally with edentate margins.

Subg. Riccia

5. Epithelial tissues in the form of free-standing, independent multicellular uniseriate hairs, formed of + clearly elongated cells. Ventral scales typically large, projecting beyond thallus margins, often strongly toothed.

Subg. Pteroriccia (Schust.) Schust.

4. Chloroplasts limited almost wholly to the ventral strata of the thallus, the dorsal tissues devoid of chlorophyll. Ventral surface with bistratose chlorophyllose transverse lamellae, oriented in broadly V-shaped configurations, from which the reduced unistratose ventral scales arise. Epithelial tissues not formed of erect filaments.

Subg. Viridisquamata (Na-Thalang)
Jovet-Ast

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REFERENCES

- Jovet-Ast, S. 1975. Précisions sur les caractères de deux Riccia du sous-genre Thallocarpus. Rev. Bryol. Lichénol. (1976), 41(4):449-56.
- 1984. Riccia (subg. Viridisquamata) caroliniana Na-Thalang, espèce endémique rélictuelle d'Australie. Cryptogamie, Bryol. Lichénol. 5,4:389-402.
- Kitagawa, N. 1984. A new genus of Hepaticae from New Caledonia. Acta Phytotax. Geobot. 35:1-6.
- Schiffner, V. 1893. Ueber exotische Hepaticae. Nova Acta Acad. Caes. Leop.-Carol. 60(2):215-316, pls. VI-XIX.
- Schuster, R.M. 1984. Diagnoses of some new taxa of Hepaticae. Phytologia 56(2):65-74.
- 1985. Austral Hepaticae, XIX. Some taxa new to New Zealand and New Caledonia. Phytologia 56(7):449-64.
- Shimizu, D. & S. Hattori. 1953-55. Marchantiales of Japan. I-IV. J. Hattori Bot. Lab. nos. 9:32-44; 10:49-55; 12:53-75; 14:91-107, figs. 1-23.
- Volk, O. H. 1983. Vorschlag für eine Neugliederung der Gattung Riccia L. Mitt. Bot. München 19:453-65.